

What is Claimed:

1. A hypotube comprising:
a tubular shaft comprising a tubular wall defining a lumen and a main section
5 connected to a distal section,
the distal section comprising a first section connected to a second section, the
first section being connected to the main section and disposed between the main
section and the second section,
the first section comprising at least one slit extending at least partially
10 through the tubular wall,
the second section comprising an elongated stinger formed by a portion of
the tubular wall.
2. The hypotube of claim 1 wherein the at least one slit of the first
15 section is further characterized as being a spiral cut extending substantially along the
first section.
3. The hypotube of claim 2 wherein the slit of the first section is further
characterized as being a spiral cut extending substantially from the proximal end to
20 the distal end of the first section.
4. The hypotube of claim 3 wherein the spiral cut has a constant pitch.
5. The hypotube of claim 4 wherein the spiral cut has a variable pitch.
- 25 6. The hypotube of claim 1 wherein the first section comprises a
proximal end integrally connected to the main section and a distal end integrally
connected to the second section, the slit of the first section is further characterized
as being a spiral cut extending substantially from the proximal end to the distal end
30 of the first section.

7. The hypotube of claim 6 wherein the spiral cut has a constant pitch.

8. The hypotube of claim 6 wherein the spiral cut has a variable pitch.

5 9. The hypotube of claim 1 wherein the second section comprises at least one slit for increasing flexibility of the second section.

10 10. The hypotube of claim 1 wherein the distal section further comprises a middle section disposed between and integrally connected to the first and second sections, the middle section being less flexible than the second section but more flexible than the first section.

15 11. The hypotube of claim 10 wherein the middle section comprises a plurality of slits in the tubular wall thereof.

12. The hypotube of claim 11 wherein the tubular wall of the middle section is at least partially collapsed.

20 13. The hypotube of claim 1 wherein the distal section further comprises a middle section disposed between and integrally connected to the first and second sections, the middle section comprising a plurality of perforations in the tubular wall thereof to make the middle section less flexible than the second section but more flexible than the first section.

25 14. The hypotube of claim 13 wherein the tubular wall of the middle section is at least partially collapsed.

30 15. The hypotube of claim 10 wherein the middle section further comprises at least one slit through the tubular wall.

16. The hypotube of claim 14 wherein the tubular wall of the middle section is at least partially collapsed between the slit and the second section.

17. The hypotube of claim 1 wherein the stinger is tapered.

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18. The hypotube of claim 1 wherein the second section comprises a plurality of stingers.

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19. The hypotube of claim 1 wherein the second section comprises an elongated cut out of the tubular wall and the stinger is formed from the remaining portion of the tubular wall.

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20. A catheter apparatus comprising:
the hypotube comprising a tubular shaft comprising a tubular wall defining a lumen and a main section integrally connected to a distal section,

the distal section comprising a first section integrally connected to a second section, the first section being integrally connected to the main section and disposed between the main section and the second section,

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the first section comprising at least one slit extending at least partially through the tubular wall,

the second section comprising an elongated stinger formed by a portion of the tubular wall.

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21. The catheter apparatus of claim 20 wherein the second section comprises an elongated cut out of the tubular wall and the stinger is formed from a remaining portion of the tubular wall.

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22. The catheter apparatus of claim 20 wherein the catheter apparatus is a stent delivery system.

23. The catheter apparatus of claim 22 wherein a distal end of the catheter is connected to a balloon.

5 24. The catheter apparatus of claim 22 wherein the catheter apparatus is a stent delivery system having a stent mounted to a balloon.

10 25. The catheter apparatus of claim 20 wherein the at least one slit of the first section is further characterized as being a spiral cut extending substantially along the first section.

26. The catheter apparatus of claim 25 wherein the spiral cut has a constant pitch.

15 27. The catheter apparatus of claim 25 wherein the spiral cut has a variable pitch.

20 28. The catheter apparatus of claim 20 wherein the first section comprises a proximal end integrally connected to the main section and a distal end integrally connected to the second section, the slit of the first section is further characterized as being a spiral cut extending substantially from the proximal end to the distal end of the first section.

25 29. The catheter apparatus of claim 28 wherein the spiral cut has a constant pitch.

30 30. The catheter apparatus of claim 28 wherein the spiral cut has a variable pitch.

31. The catheter apparatus of claim 20 wherein the second section comprises at least one slit for increasing flexibility of the second section.

32. The catheter apparatus of claim 20 wherein the distal section further comprises a middle section disposed between and integrally connected to the first and second sections, the middle section being less flexible than the second section but more flexible than the first section.

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33. The catheter apparatus of claim 32 wherein the middle section comprises a plurality of slits extending at least partially through the tubular wall thereof.

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34. The catheter apparatus of claim 32 wherein the tubular wall of the middle section is at least partially collapsed.

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35. The catheter apparatus of claim 18 wherein the distal section further comprises a middle section disposed between and integrally connected to the first and second sections, the middle section comprising a plurality of perforations in the tubular wall thereof to make the middle section less flexible than the second section but more flexible than the first section.

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36. The catheter apparatus of claim 35 wherein the tubular wall of the middle section is at least partially collapsed.

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37. The catheter apparatus of claim 35 wherein the middle section further comprises at least one slit through the tubular wall.

38. The catheter apparatus of claim 37 wherein the tubular wall of the middle section is at least partially collapsed between the slit and the second section.

39. The catheter apparatus of claim 20 wherein the stinger is tapered.

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40. The catheter apparatus of claim 20 wherein the second section comprises a plurality of stingers.

41. A method for fabricating a hypotube for an intravenous device, the method comprising:

providing a tubular shaft comprising a tubular wall defining a lumen and a main section integrally connected to a distal section,

5 cutting a first section of the distal section that is disposed between and integrally connected to the main section and a second section to provide at least one slit extending at least partially through the tubular wall for of the first section,

cutting the second section to provide an elongated cut-out of the tubular wall and an elongated stinger formed by a portion of the tubular wall of the second section.

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42. The method of claim 41 wherein the cutting of the at least one slit in the first section is further characterized as cutting a spiral cut extending substantially along the first section.

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43. The method of claim 41 further comprising cutting at least one slit in the second section.

44. The method of claim 41 wherein the distal section further comprises a middle section disposed between and integrally connected to the first and second sections, the method further comprising

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cutting at least one slit in tubular wall of the middle section to make the middle section less flexible than the second section but more flexible than the first section.

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45. The method of claim 44 further comprising at least partially collapsing the tubular wall of the middle section.

46. The method of claim 41 wherein the distal section further comprises a middle section disposed between and integrally connected to the first and second sections, the method further comprising perforating the tubular wall of the middle section.

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47. The method of claim 46 further comprising at least partially collapsing the tubular wall of the middle section.

48. The method of claim 46 further comprising cutting a slit in tubular wall of the middle section and at least partially collapsing the tubular wall of the middle section between the slit and the second section.

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49. The method of claim 41 wherein the cutting of the second section results in the stinger being tapered.

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50. The method of claim 41 wherein the cutting is performed using a laser.

51. The method of claim 41 wherein the cutting of the second section results in a plurality of stingers.

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52. A hypotube comprising:
a tubular shaft comprising a tubular wall defining a lumen and a main section connected to a distal section,
the distal section comprising at least one slit extending at least partially through the tubular wall,
the distal section further comprising an elongated cut-out of the tubular wall which forms an elongated stinger.

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53. The hypotube of claim 52 wherein the at least one slit is further characterized as being a spiral cut extending substantially along the distal section.

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54. The hypotube of claim 53 wherein the spiral cut has a constant pitch.

55. The hypotube of claim 53 wherein the spiral cut has a variable pitch.

5 56. The hypotube of claim 52 wherein the tubular wall of the distal section is at least partially collapsed.

57. The hypotube of claim 52 wherein the stinger is tapered.

10 58. The hypotube of claim 52 wherein the distal section comprises a plurality of stingers.

59. A method for fabricating a hypotube for an intravenous device, the method comprising:

15 providing a tubular shaft comprising a tubular wall defining a lumen and a main section integrally connected to a distal section,

cutting the distal section to provide at least one slit extending at least partially through the tubular wall for of the distal section for increasing flexibility of the distal section,

20 cutting the distal section to provide an elongated cut-out of the tubular wall and at least one elongated stinger formed by a remaining portion of the tubular wall of the distal section.

25 60. The method of claim 59 wherein the cutting of the at least one slit in the first section is further characterized as cutting a spiral cut extending substantially along the distal section.

61. The method of claim 59 further comprising at least partially collapsing the tubular wall of the distal section.

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62. The method of claim 59 wherein the cutting is performed using a laser.

5 63. The method of claim 59 wherein the cutting of the distal section results in a formation of a plurality of stingers.

64. A hypotube comprising:
a tubular shaft comprising a tubular wall defining a lumen and a main section connected to a distal section,
10 the distal section comprising at least one slit extending at least partially through the tubular wall,
the distal section further comprising a distal end connected to a stinger element.

15 65. The hypotube of claim 64 wherein the at least one slit is further characterized as being a spiral cut extending substantially along the distal section.

66. The hypotube of claim 64 wherein the spiral cut has a constant pitch.

20 67. The hypotube of claim 64 wherein the spiral cut has a variable pitch.

68. The hypotube of claim 64 wherein the tubular wall of the distal section is at least partially collapsed.

25 69. The hypotube of claim 64 wherein the stinger is tapered.

70. The hypotube of claim 64 wherein the distal end is connected to a plurality of stingers.

71. A method for fabricating a hypotube for an intravenous device, the method comprising:

providing a tubular shaft comprising a tubular wall defining a lumen and a main section integrally connected to a distal section,

5 cutting the distal section to provide at least one slit extending at least partially through the tubular wall for of the distal section for increasing flexibility of the distal section,

connecting at least one stinger element to a distal end of the distal section.

10 72. The method of claim 71 wherein the cutting of the at least one slit in the first section is further characterized as cutting a spiral cut extending substantially along the distal section.

15 73. The method of claim 71 further comprising at least partially collapsing the tubular wall of the distal section.

74. The method of claim 71 wherein the cutting is performed using a laser.

20 75. The method of claim 71 wherein the connecting comprises connecting a plurality of stingers to the distal end of the distal section.